**Testimony of**

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## Hearing on Corporate Average Fuel Economy Standards

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*Center for a Sustainable Economy is a non-profit, non-partisan research and policy organization that promotes innovative tax and other market-based approaches to achieving a sustainable economy—one that integrates long-term economic prosperity, environmental quality and social fairness.*

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Good morning Mr. Chairman and Members of the Committee. I want to thank the Committee on Commerce, Science and Transportation for inviting me to testify this morning on the economics of increasing Corporate Average Fuel Economy (CAFE) standards.

I am Andrew Hoerner, Director of Research for the Center for a Sustainable Economy. The Center is a non-profit, non-partisan research and policy organization devoted to promoting innovative, market-based approaches to achieving an economy that combines long-term economic prosperity, environmental quality, and social fairness.

The issue of CAFE is a complex one. It involves policy issues in national security, environmental quality, consumer safety, trade and competitiveness, and the economic health of an important industry. My testimony today focuses primarily on the consequences of increased CAFE standards on employment. It is based on a series of economic simulations that we did jointly with the Economic Policy Institute as part of an effort to model labor impacts of a comprehensive climate and energy policy.

Our findings are rooted in one simple observation: every dollar of the cost of producing a car is paid to somebody. The reason cars are more expensive when you increase efficiency standards is because you are using more labor or more expensive materials or both. We find that higher CAFE standards, which increase the price of automobiles, would also increase employment in the U.S. auto industry by a modest amount, despite significantly increased imports of foreign cars and lower purchases of cars by U.S. consumers.

My testimony will be based on a reference scenario in which the car and light truck fleets are combined, and the combined CAFE is increased from its current level of approximately 24 MPG to 34 MPG after 10 years and 50 MPG in 20 years. This increase is phased in over a 15-year period, starting in five years. These fleet average numbers are approximately equivalent to auto standards of 48 mpg in 2010 rising to 68 mpg in 2020 and light truck standards of 30 mpg in 2010 and 42 mpg in 2020.

We do not allege that this scenario is in any sense optimal. It is a realistic scenario in that the rate of improvement in CAFE is roughly 80% of the rate that was maintained in the previous period of CAFE increases, 1978 to 1985. The specifics of our results depend on the exact scenario that we analyze. However, we believe that the qualitative features described below would be maintained over quite a wide range of CAFE increases, including any increases smaller than those we examine. These qualitative features include increased auto cost, reduced fuel consumption and expenditures, consumer impacts that are positive over the life of the car at auto-financing discount rates, a decrease in the number of domestically produced autos sold together with an increase in the total value of those autos, and an increase in domestic auto industry employment.

Our cost and technology assumptions are taken from estimates by the U.S. Department of Energy national labs.[1] They are similar to those used in the recent National Academy of Sciences assessment of CAFE,[2] though the policy package we analyze is more aggressive in some other dimensions, such as public funding of energy research.

These cost estimates were then used to estimate employment, trade, and other economic consequences of the scenario using the LIFT (Long-term Interindustry Forecasting Tool) model of the Inforum academic research and consulting group at the University of Maryland. Inforum has a well-respected, 20-year track record performing macroeconomic modeling. The LIFT model is a 97-sector inter-industry macroeconomic model. It tracks more than 800 macroeconomic variables, and is unique in the extent to which it builds up aggregate demand from individual industry demands at a high level of industrial detail.

It is generally agreed that substantial increases in CAFE will increase the cost of motor vehicles, all other things held constant. In our scenario, the average cost of passenger cars and light trucks increases relative to the base price by 1 percent in year five, rising steadily to fifteen percent in year 20. This increase in auto price and fuel efficiency has a

number of effects.

For consumers, the estimated fuel savings offset the increase in cost of the vehicles. All of the increased cost, however, occurs up front when the consumer purchases the vehicle; while the fuel savings occur over the vehicle's life. Thus, whether the net result is positive or negative depends on the rate at which you discount the fuel savings. For reasons that are not well understood, but which may relate to imperfect information in the auto market, consumers appear to discount energy efficiency savings at a higher rate than most other credit transactions. At a fifteen percent discount rate, similar to the rate consumers appear to employ for these transactions, the result is a net benefit for car purchasers in 2010 and a small net burden for car purchasers in 2020. On the other hand, it would appear to be more rational to use a rate similar to the typical automobile financing rate. If such a rate (roughly nine percent for bank-financed car loans[3]) is used, the reference CAFE scenario would provide a net benefit to consumers in every year.

How would such standards affect domestic employment in the auto industry? Employment is the product of two factors, the number of domestically produced automobiles and the number of workers per car.

We estimate that the increase in the cost of vehicles meeting a higher CAFE standard will slightly decrease the output of the U.S. auto industry. Over the first decade, the average decrease relative to the baseline is 1.4 percent (not 1.4 percent per year). In the second decade, this average decrease rises to 5.5 percent. A small portion of this decrease is due to consumer responses to higher prices. However, the bulk of the decrease -- more than 90 percent in both decades -- is due to increased imports of foreign cars.

We assume that foreign producers have the lead on U.S. producers in the manufacture of high-efficiency vehicles. To capture this in our modeling framework, we assume that foreign producers are able to supply vehicles meeting the higher CAFE standards at half the incremental cost of U.S. producers. The cost advantage assumed here is probably at the high end of what most industry experts would estimate. If the cost advantage of foreign producers in producing highly-efficient vehicles is assumed to be lower, the negative impact on output would be lower and the employment benefit would be higher.

According to the Department of Energy estimates we used, the cost of achieving our reference CAFE standards would amount to fifteen percent of vehicle cost in year twenty. This cost is divided between increased labor and increased materials costs, and is born partly by consumers and partly by producers. Increased materials costs provide employment benefits to other industries, but not to the auto industry itself. We estimate increased labor requirements per vehicle to average 2.2 percent in the first decade and 6.1 percent in the second decade.

The combined effect of the decrease in domestic output and the increase in domestic labor requirements per car is a small net employment increase, averaging about 0.8 percent (5500 jobs) in the first decade and 0.6 percent (4400 jobs) in the second decade. These job gains could be improved by a factor of approximately two in the first decade and ten in the second decade if policies could be devised to avoid the loss of market share to imports. I will suggest one such policy in a moment.

We did not model the effect of an increase in CAFE standards on exports of U.S.-made vehicles. The rest of the industrialized world is moving rapidly to adopt increasingly tight auto efficiency standards. It seems clear that if the U.S. is alone or nearly alone in maintaining lower efficiency standards, U.S. manufacturers will find it increasingly difficult to sell their cars in foreign markets. Thus it appears reasonable to assume that increased CAFE standards in the U.S. will increase exports of U.S.-made autos. However, we were not able to quantify this effect. If this effect could be estimated, it would mitigate the loss of auto industry output and further increase the auto industry job gain.

One possible approach to reducing the negative impact of increased CAFE standards on market share is to provide production tax credits for U.S. producers of super-efficient vehicles that exceed the CAFE standard. Assuming that the

CAFE standards are binding, such credits would not further improve auto efficiency (unless vehicles receiving the credit are excluded from CAFE calculations). This is because, for each vehicle that exceeds the CAFE standard, manufacturers can produce offsetting vehicles below the standard. However, if properly designed, production tax credits could offer several other benefits. They could:

- provide incentives to accelerate the introduction of new technologies;[4]
- increase the stock of vehicles exceeding the CAFE standard, thus providing "slack" to reduce the cost of CAFE for other new vehicles not receiving the credit;
- mitigate the increase in vehicle price and help maintain market share for the U.S. industry; and
- share the incremental cost of super-efficient vehicles between the purchaser and the public.

We believe that cost-sharing with the public is appropriate to the extent that CAFE offers benefits -- such as reduced air pollution, reduced global warming, and reduced macroeconomic exposure to global oil price shocks -- that flow to the public at large.

Note that in order to offset competitive burdens on U.S. producers, these must be production, rather than purchase or consumption, tax credits. Purchase tax credits go to U.S. consumers of high-efficiency vehicles, regardless of where those vehicles are produced. Production tax credits go to U.S. producers of high-efficiency vehicles, regardless of where those vehicles are purchased. Purchase credits would reduce the cost of higher-efficiency autos to consumers, but would not help to preserve U.S. market share. Production credits are particularly appropriate to the extent that CAFE standards are intended to reduce global warming, as super-efficient vehicles produce an equivalent reduction in $CO_2$ emissions whether they are purchased domestically or abroad. Most economists would agree that such tax credits, whether on production or purchase, are best financed through either increased fees on low-efficiency vehicles or a small increase in gasoline taxes.

For the economy as a whole, the impact on personal income of the CAFE program we studied is unambiguously positive. Increased CAFE standards essentially constitute a program of forced investment in auto efficiency. The return comes in the form of energy savings. The estimated real rate of return to this consumer investment in auto efficiency in our reference scenario varies with the period and vehicle type. But the return averages more than ten percent over the entire period and vehicle stock. This is more than a third higher than the long-term average real rate of return on corporate stocks.[5] It is even higher when compared to the average consumer's investment portfolio, which typically includes securities such as bonds and bank accounts with lower risks and returns. Returns of this magnitude imply that consumers will have more money to spend, increasing personal income.[6]

In summary, we have found that increased CAFE standards raise the price of domestically produced autos and the labor requirements per car. The net effect of this is to increase employment in the U.S. auto industry slightly, but erode the market share of U.S. producers. The latter effect would be smaller if the foreign cost of energy efficiency improvements were more similar to the U.S. cost, or if increased CAFE standards cause an increase in exports. We recommend that further research in these areas be undertaken.

The negative effect of CAFE increases on output can be reduced, and the positive effect on employment increased, if tax credits are used to share the increased cost of super-efficient vehicles between the purchaser and the public. These must be production credits to be effective. They are best financed with charges on low-efficiency vehicles or a small increase in motor fuels taxes. Finally, increased CAFE standards provide a high rate of return to consumer investment and increase personal income.

Thank you. I would be happy to take any questions.

[1] Specifically, from the CAFE sensitivity case in chapter six of Interlaboratory Working Group. 2000. *Scenarios for a Clean Energy Future*. LBNL-44029 and ORNL/CON-476. Washington D.C.: U.S. Government Printing Office. <http://www.ornl.gov/ORNL/Energy_Eff/CEF.htm>

[2] National Academy of Sciences, Committee on the Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards, Board on Energy and

Environmental Systems, Transportation Research Board, National Research Council, *Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards*, Washington DC: National Academy Press (2002), <http://www.nap.edu/catalog/10172.html?onpi_newsdoc073001>.

[3] See, e.g., <http://www.bankrate.com/brm/news/fed/fedchart.asp>.

[4] For an estimate of the magnitude of this effect, see Hoerner, J. Andrew and Avery Gilbert, *Assessing Tax Incentives for Clean Energy Technologies: A Survey of Experts Approach*, Washington D.C.: Center for a Sustainable Economy (April 2000) < http://www.sustainableeconomy.org/abstract.htm>.

[5] Roger Ibbotson, *Stocks, Bonds, Bills, and Inflation: Classic Edition Yearbook* Chicago: Ibbotson Associates (2002).

[6] Some of this benefit may be offset in terms of economic welfare (but not in terms of personal income) if high-efficiency vehicles have lower performance on other dimensions important to consumers, such as performance or carrying capacity.